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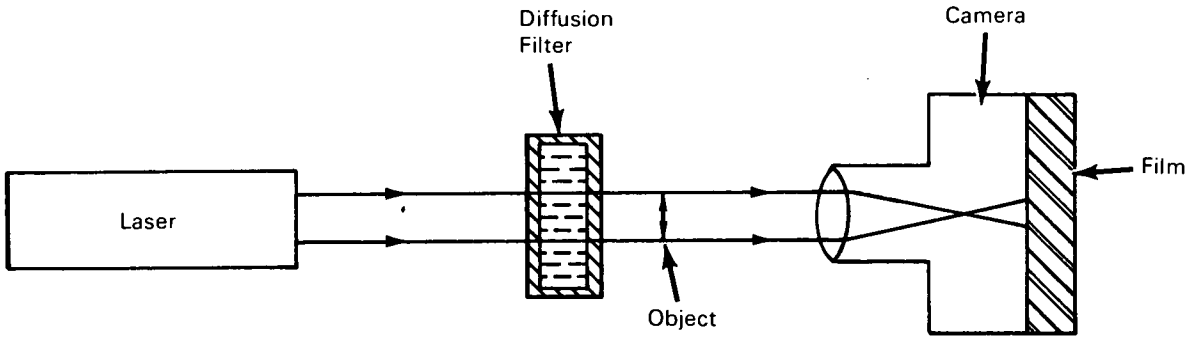
NASA TECH BRIEF

Diffusion Filter Eliminates Fringe Effects of Coherent Laser Light Source



The problem:

The coherence property of a laser beam used as a photographic light source causes interference patterns which obscure details in the photographic film.

The solution:

A diffusion filter (see fig.) comprised of small particles in colloidal suspension reduces the coherence of the laser beam. The intensity and collimation are moderately affected.

How it's done:

The size of the particles is selected to be larger than the wavelength of the laser beam, so that ordinary diffuse reflection from the surface of the particles will occur without degradation of the laser frequency. It is preferable to utilize a disperse phase of solid particles in a state of subdivision adapted to form a colloidal suspension in a liquid disperse medium. In a solid-liquid colloidal suspension, the fine particles remain suspended and will not readily settle out. Therefore, homogeneity without external mixing of the suspension is inherently achieved. Suitable colloidal suspensoids are prepared by suspending colloidal size particles, such as milk solids or gold particles in water.

Notes:

1. The diffusion filter is a very useful tool in high-speed photography applications which require exceptional resolution.
2. Requests for further information may be directed to:

   Technology Utilization Officer
   NASA Pasadena Office
   4800 Oak Grove Drive
   Pasadena, California 91103
   Reference: B70-10226

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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Category 03